

# AS1 (Assignment 1): Unit 1

## Introduction to Terminology, Scales of Measurement, Notation and Basic Computation

1. A researcher investigates the effects of amphetamine on memory. The researcher selects a random sample of 50 undergraduate students from a major New Jersey University. Half (25) of the students selected receive amphetamine while studying a word list and half (25) of the students receive a placebo. For this study
  - a. Identify the population: Undergraduate Students
  - b. Identify the sample: 25 students that receive amphetamine, and 25 students that receive placebo.
2. Define the terms:
  - a. Population: An entire group the researcher will study.
  - b. Sample: A subset of the population, meaning it is not the entire population but a part of the population.
  - c. Parameter: A sum up of data from the population.
  - d. Statistic: A sum up of data from the sample.
3. Name 3 descriptive statistics methods
  - 1) Histograms or bar graphs.
  - 2) Calculating measures of central tendency.
  - 3) Calculating measures of variability.

Please place a T if the statement is true and an F if the statement is false in the space provided.

- T   4. A researcher calculates a mean from a population. Her mean is an example of a parameter.
- T   5. A researcher calculates a mean from a sample set of data. His mean is a statistic.
- T   6. The entire group of alcoholics in the state of NJ is an example of a population.
- F   7. A researcher who selects a sample from a population should expect no difference between the sample mean statistic and the true population parameter.
- T   8. The participants in a research study are classified as high, medium, or low in self-esteem. This classification involves measurement on an ordinal scale.
- F   9. A continuous variable must be measured on a nominal or an ordinal scale.

- F    10. Students in an introductory art class are classified as art majors and non-art majors. This is an example of measurement on an ordinal scale.
- F    11. Men's shirt sizes are classified as small, medium, large, and extra-large. This is an example of measurement on an interval scale.
- T    12. A researcher records the number of errors a rat makes running a maze. This is an example of measurement on a ratio scale.
- T    13. To determine how much difference there is between two individuals, you must use either a nominal or interval scale of measurement.
- F    14. If a researcher measures two individuals on a nominal scale, it is possible to determine which individual has the smaller score.
- T    15. Recording the number of students who are absent each day at a high school would be an example of measuring a continuous variable.
- F    16. A track coach records how much time each runner takes to complete the 100-yard dash. This is an example of measuring a discrete variable.
- T    17. Gender is a discrete variable while age is a continuous variable.
- F    18. A data set is described as consisting of  $n = 15$  scores. Based on the notation being used, the data set is a population.
- F    19. To compute  $(\sum X)^2$ , you have to remember to first square all of the scores.
- T    20. For the following scores, 1, 3, 5,  $\sum X^2 = 35$ .
- F    21. For the following scores, 4, 4, 2, 0,  $(\sum X)^2 = 36$ .

22. Statistical techniques are classified into two major categories: Name the categories and differentiate one major difference between them:

The two major categories of statistical techniques are descriptive statistics and inferential statistics. The biggest difference between them is that descriptive statistics can illustrate the data but not explained the data. However, inferential statistics provide researchers with the ability to explain data.

23. You (1) select 30 people from a population, (2) measure the IQ of those 30 people, and (3) calculate a mean statistic = 110. What should you expect as far as the mean parameter? That is, would you expect the corresponding mean parameter to also be 110?

I expect the mean parameter to be the data set of the population IQ, meaning the parameter mean represents the average of the population's IQ. I would not expect the mean parameter mean of the data set to be 110 because I do not know the set of scores of the IQ.

24. Calculate each value requested for the following set of scores. Scores: 1, 7, 6, 4, 3, 0, 0, 1

$$N = \underline{8} \quad \Sigma X = \underline{22} \quad \Sigma X^2 = \underline{44} \quad (\Sigma X)^2 = \underline{112}$$

25. For the following set of scores, find the value of each expression: 10, 11, 10, 9, 7

$$\Sigma X = \underline{47}$$

$$\Sigma X^2 = \underline{2,209}$$

$$(\Sigma X)^2 = \underline{451}$$

26. For the following set of scores, find the value of each expression

X  
4  
0  
-3

a.  $\Sigma X = \underline{1}$

b.  $\Sigma X^2 = \underline{25}$

c.  $(\Sigma X)^2 = \underline{1}$

27. For the following set of scores, find the value of each expression:

X  
6  
-2  
3  
-1

$$n = \underline{4}$$

$$\Sigma X = \underline{6}$$

$$\Sigma X^2 = \underline{50}$$

$$(\Sigma X)^2 = \underline{36}$$

28. Two scores, X and Y, are recorded for each of  $n = 4$  subjects. For these scores, find the value of each expression.

Subject	X	Y
A	4	3
B	0	7
C	-1	5
D	3	2

$$\Sigma X = \underline{6}$$

$$\Sigma Y = \underline{17}$$

29. For each set of scores at the right, find the value of each expression.

x  
2  
4  
0  
-2

$$n = \underline{4}$$

$$\Sigma X = \underline{4}$$

$$\Sigma X^2 = \underline{24}$$

$$(\Sigma X)^2 = \underline{16}$$